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09-997,158	11/28/2001	Stephen E. Savas	14912.833	3614

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/997,158

Applicant(s)

SAVAS ET AL

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☒ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Oath/Declaration***

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:  
Non-initialed and/or non-dated alterations have been made to the oath or declaration (see information of inventor Ronald L. Kinder). See 37 CFR 1.52(c).

### ***Drawings***

Figure 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference numbers 202 and 204 in figure 9, it is suggested to amend figure 9 so that reference numbers 202 and 204 read 312 and 314, respectively. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

reference numbers 1080a, 1070a, 1024a, 1012a, 1050a, 1012b, 1024b, 1090b, 1050b, 1070b, 1080b (fig. 10). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

The abstract of the disclosure is objected to because at line 8, after "integral part", seems that – of – should be inserted for proper grammar. Correction is required. See MPEP § 608.01(b).

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities: at page 26- line 26, after "chamber", seems that – is provided – should be inserted.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-9 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 6-line 1, the phrase "Z dimension" renders the claimed indefinite because it is unclear if the claimed dimension refers to the length, depth or width when viewing the cross section of the apparatus. Clarification is requested.

In claim 6-line 2, the phrase "greater than from about" is unclear because the scope of the claim cannot be determined from the phrase "from about 10 to 15 percent".

In claim 6-line 3, the phrase "less than from about" is unclear because the scope of the claim cannot be determined from the phrase "from about 25 to 30 percent".

In claim 7-lines 1-2, the phrases "X dimension" and "Y dimension" render the claimed indefinite because it is unclear if the claimed dimension refers to the length, depth or width when viewing the cross section of the apparatus. Clarification is requested.

In claim 8-lines 1-2, the phrases "X dimension" and "Y dimension" render the claimed indefinite because it is unclear if the claimed dimension refers to the length, depth or width when viewing the cross section of the apparatus. Clarification is requested.

In claim 8-line 2, the phrase "as great as" renders the claim indefinite in scope. It is suggested to delete the phrase from the claim.

In claim 9-line 2, the phrase "about  $\pm$  15 percent" renders the claim indefinite because it is unclear how or where the plasma uniformity is determined.

In claim 14-line 3, the word "may" is vague and indefinite. The examiner interprets the term "may" to mean, possibly but not certainly. Therefore, it is unclear whether negatively charged particles recombine or not.

In claim 15-line 2, the phrase "better than  $\pm 15$  percent" renders the claim indefinite because it is unclear how or where the uniformity of the ion flux is determined.

In claim 16-line 1, the use of the word "surface" in the phrase "the maximum potential surface" is unclear because it seems that the "surface" being referred to is not a physical structure but a location inside the chamber.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 10, 13-14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al., U.S. Patent 5,522,934.

Suzuki et al. shows the invention as claimed including a plasma reactor system for processing a substrate W, the plasma reactor comprising: a processing chamber 4

for containing a plasma, the plasma comprising at least one plasma product for processing the substrate; a gas inlet 18 coupled to the processing chamber for providing gas to the processing chamber; a first power source 108; an induction coil 106, coupled to the first power source, to couple power from the first power source into the processing chamber to sustain the plasma; a plasma shaping member 138 positioned adjacent the top wall of the processing chamber, the plasma shaping member having a recessed portion substantially above the center of the substrate and an extended portion outside the recessed portion, and made of quartz; and a support 120 for the substrate positioned such that the substrate is exposed to the at least one plasma product during processing (see figs. 18-19 and col. 17-line15 to col. 18-line 26). Furthermore, with respect to claims 13-14 and 16, note that the plasma shaping member of Suzuki et al. will inherently produce the claimed limitations.

Claims 1-4, 10-11, 13-14 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Brcka, U.S. Patent 6,446,572.

Brcka shows the invention as claimed including a plasma reactor system for processing a substrate 24, the plasma reactor comprising: a processing chamber for containing a plasma, the plasma comprising at least one plasma product for processing the substrate; a gas inlet coupled to the processing chamber for providing gas to the processing chamber; a first power source 44; an induction coil 42 coupled to the first power source, to couple power from the first power source into the processing chamber to sustain the plasma; a plasma shaping member 48/50 positioned adjacent the top wall

of the processing chamber, the plasma shaping member having a recessed portion 48 substantially above the center of the substrate and an extended portion 50 outside the recessed portion, and made of a metal; and a support 20 for the substrate positioned such that the substrate is exposed to the at least one plasma product during processing (see figs. 1-3 and col. 5-line 3 to col. 8-line 42). Furthermore, with respect to claims 13-14 and 16, note that the plasma shaping member of Brcka will inherently produce the claimed limitations. Also, note that recessed portion 48 is a Faraday shield.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).



Claims 5-9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al., U.S. Patent 5,522,934.

Suzuki et al. is applied as above but does not expressly disclose the dimensions of the plasma shaping member, the plasma uniformity and the uniformity of the ion flux to the substrate, as claimed in claims 5-9 and 15, but, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (see *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum plasma shaping member dimensions, plasma uniformity and uniformity of the ion flux to the substrate, based upon, for example, the particular size of the substrate, and would not lend patentability to the instant invention without the showing of unexpected results.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al., U.S. Patent 5,522,934 in view of Savas et al., U.S. Patent 5,811,022.

Suzuki et al. is applied as above but does not expressly disclose that the apparatus further comprises a Faraday shield or a charged particle filter. Savas et al. discloses an inductive plasma apparatus in which a split Faraday shield is used to control the modulation of the plasma potential (see, for example, the abstract).

Furthermore Savas et al. discloses the use of charged particle filter to reduce the charged particle current reaching the substrate and to block the EV radiation that may be generated in the plasma from reaching the substrate (see, for example, col. 24-lines 47-59). Therefore, in view of these disclosures, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Suzuki et al. as to further comprise a Faraday shield and a charged particle filter in order to optimize the apparatus and to reduce damage to substrate being processed in the apparatus.

Claims 5-9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brcka, U.S. Patent 6,446,572.

Brcka is applied as above but does not expressly disclose the dimensions of the plasma shaping member, the plasma uniformity and the uniformity of the ion flux to the substrate, as claimed in claims 5-9 and 15, but, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (see *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine experimentation the optimum plasma shaping member dimensions, plasma uniformity and uniformity of the ion flux to the substrate, based

upon, for example, the particular size of the substrate, and would not lend patentability to the instant invention without the showing of unexpected results.

Claim 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brcka, U.S. Patent 6,446,572 in view of Savas et al., U.S. Patent 5,811,022.

Brcka is applied as above but does not expressly disclose that the apparatus further comprises a charged particle filter. Savas et al. discloses an inductive plasma apparatus in which a charged particle filter is used to reduce the charged particle current reaching the substrate and to block the EV radiation that may be generated in the plasma from reaching the substrate (see, for example, col. 24-lines 47-59). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Brcka as to further comprise a charged particle filter in order to optimize the apparatus and to reduce damage to substrate being processed in the apparatus.

### ***Conclusion***

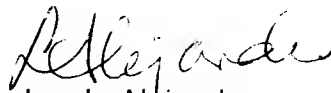
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Luz L. Alejandro  
Patent Examiner  
Art Unit 1763

March 18, 2003